

04-18-04

IMAGE & AF/287

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Seguin et al.

GROUP: 2876

SERIAL NO: 10/056,352

EXAMINER: Unknown

FILED: January 24, 2002

FOR: TEST TUBE WITH DATA MATRIX CODE MARKINGS

Commissioner of Patents
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TRANSMITTAL OF APPEAL BRIEF (PATENT APPLICATION--37 CFR 192)

1. Transmitted herewith in triplicate is the APPEAL BRIEF in this application with respect to the Notice of Appeal filed on February 25, 2004.

NOTE: "The appellant shall, within 2 months from the date of the notice of appeal under 1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief *in triplicate*." 37 CFR 1.192(a) [emphasis added]

2. STATUS OF APPLICANT

This application is on behalf of
X other than a small entity

— small entity
verified statement:

— attached

— already filed

3. FEE FOR FILING APPEAL BRIEF

Pursuant to 37 CFR 1.17(f) the fee for filing the Appeal Brief is:

— small entity \$160.00

X other than a small entity \$330.00

Appeal Brief fee due \$ 330.00

CERTIFICATE OF MAILING (37 CFR 1.8(a))

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the United States Postal Service on April 14, 2004 in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number EV383578662US addressed to the: Commissioner of Patents, P.O. Box 1450 Alexandria, VA 22313-1450

Meghan H. Carr
Meghan H. Carr

4. EXTENSION OF TERM

NOTE: The time periods set forth in 37 CFR 1.192(a) are subject to the provision of 1.136 for patent applications. 37 CFR 1.191(d). Also see Notice of November 5, 1985 (1060 O.G. 27).

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136 apply.

(complete (a) or (b) as applicable)

- (a) ☐ Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-d)) for the total number of months checked below:

<u>Extension (months)</u>	<u>Fee for other than small entity</u>	<u>Fee for small entity</u>
<input type="checkbox"/> one month	\$110.00	\$55.00
<input type="checkbox"/> two months	\$420.00	\$210.00
<input type="checkbox"/> three months	\$950.00	\$475.00
<input type="checkbox"/> four months	\$1,480.00	\$740.00
		Fee \$

If an additional extension of time is required please consider this a petition therefor.

(check and complete the next item, if applicable)

- ☐ An extension for _____ months has already been secured and the fee paid therefor of \$ _____ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request \$

or

- (b) ☒ Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

5. TOTAL FEE DUE

The total fee due is:

Appeal brief fee \$ 330.00
Extension fee (if any) \$

TOTAL FEE DUE \$ 330.00

6. FEE PAYMENT

X Attached is a check in the sum of \$ 330.00.

 Charge Account No. 19-0079 the sum of .
A duplicate of this transmittal is attached.

7. FEE DEFICIENCY

NOTE: If there is a fee deficiency and there is no authorization to charge an account, additional fees are necessary to cover the additional time consumed in making up the original deficiency. If the maximum, six month period has expired before the deficiency is noted and corrected, the application is held abandoned. In those instances where authorization to charge is included, processing delays encountered in returning the papers to the PTO Finance Branch in order to apply these charges prior to action on the cases. Authorization to charge the deposit account for any fee deficiency should be checked. See the Notice of April 7, 1986, 1065 O.G. 31-33.

X If any additional extension and/or fee is required, this is a request therefor and to charge Account No. 19-0079.

Respectfully submitted,



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Seguin et al. **GROUP:** 2876
SERIAL NO: 10/056,352 **EXAMINER:** K. Koyama
FILED: January 24, 2002
FOR: TEST TUBE WITH DATA MATRIX CODE MARKINGS

Mail Stop Appeal Briefs
Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF

Pursuant to 35 U.S.C. §134 and 37 C.F.R. §§1.191, 1.192 and 1.196, Appellants` respectfully appeals to the Board of Patent Appeals and Interferences from the Examiner's final rejection of applicant's Patent Application Ser. No. 10/056,352 filed January 24, 2002.

1. REAL PARTY IN INTEREST

The real party in interest in the present case is the Assignee, Matrix Technologies Corporation.

2. RELATED APPEALS AND INTERFERENCES

The present application has no pending related appeals or interferences.

3. STATUS OF CLAIMS

Claims 22-32 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Wijnschenck et al. (U.S. Patent 6,270,728) in view of Moh et al. (U.S. Patent 6,165,594).

Claims 33-36 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Wijnschenck et al. (U.S. Patent 6,270,728) in view of Moh et al. (U.S. Patent 6,165,594) and Mizobuchi et al. (U.S. Patent 6,133,342).

4. STATUS OF AMENDMENTS

No amendments after the final rejection have been filed.

5. SUMMARY OF THE INVENTION

The present invention is directed to a test tube 10 comprising a tube body of unitary construction. The tube body comprises enclosed sidewall 12 and an integral bottom that together define a tubular container having an open top 16. The bottom has an exterior surface 14 upon which machine readable data 21 is encoded within an opaque coating deposited onto the exterior surface 14 to uniquely identify the test tube 10. See specification at page 4, lines 10-21, bridging to page 5, lines 1-4, page 6, lines 18-21 and Figs. 1-3.

The invention is also directed to a method of manufacturing a test tube comprising the steps of providing a tube body of unitary construction comprising an enclosed sidewall with an open top and an integral bottom with an exterior surface, applying an opaque coating to the exterior surface and encoding machine readable data within the opaque coating. See specification at page 5, lines 5-21, bridging to page 6, lines 1-21, bridging to page 7, lines 1-5.

6. ISSUES

The issue before the Board in this appeal is whether the Examiner was correct in rejecting independent claims 22 and 29 under 35 U.S.C. 103(a) as being unpatentable over Wijnschenck et al. in view of Moh et al., the remaining dependent claims being rejected on the same or primarily the same premise as that of claims 22 and 29.

7. GROUPING OF CLAIMS

For the purpose of this appeal, claims 22-36 stand or fall together.

8. **ARGUMENT**

Claim 22 claims a test tube having a unitary construction, with machine readable data encoded within an opaque coating deposited onto the exterior surface of the tube bottom.

Claim 22 stands finally rejected as being obvious over Wijnschenk et al. in view of Moh et al. Wijnschenk et al. teaches machine readable data encoded into the surface of a separate carrier part 6 attached to a test tube bottom. Moh et al. teaches a temperature resistant label that is attachable to a substrate. Neither Wijnschenk et al. or Moh et al., either when viewed singly, or in combination, disclose or suggest the unitary test tube concept claimed in claim 22, where the machine readable data is encoded within an opaque coating on the exterior bottom surface of the test tube.

To support her obviousness rejection of claim 22 and in response to Appellants' arguments set forth in the Response filed on September 4th, 2003, the Examiner states:

"Wijnschenk et al. shows a test tube (FIG 1) comprising an enclosed sidewall 2 and an integral bottom 6 that together define a tubular container 1 having an open top 20, wherein the bottom surface has a concave interior surface 3 and a planar surface 7 upon which machine readable data coding 9 is encoded on a label...The Appellant emphasizes machine readable data encoded on a separate carrier part 6 attached to a test tube bottom...label that is attachable to a substrate. "However, the instant claim recites, "machine readable data is encoded within an opaque coating deposited onto said exterior surface," which includes attachable labels and separate carrier part attach to a test tube bottom. Taken the broadest interpretation of the claim, the phrase "deposited" includes, but not limited to, the meaning attached "attached". Unless the claim is limited to non-attachable labels, the examiner remains her position and believes that the references still read on the claims."

See pgs. 2 and 5 of the Final Office Action dated December 30th, 2003 [emphasis added]. Apparently, the Examiner's position is that the carrier part 6 is a "coating" that is deposited onto the bottom surface of the tubular container 2.

It is submitted that the attachment of the carrier part 6 to the tubular container 2 can not fairly be construed as meeting the aforementioned limitation because the carrier part 6 is simply not a "coating". Moreover, even assuming that carrier part 6 could be construed as a "coating", the carrier part 6 is not deposited onto the bottom surface of the tubular container 2.

Wijnschenk et al. states:

"...it is very advantageous according to the invention if the material of the carrier part is suitable for burning in the optically readable coding by means of a laser technique, which coding in this case is preferably a fine dot code. What is meant here by a fine dot code is a code in which the centre-to-centre distance between adjacent dots is less than 0.5mm, preferably 0.4 to 0.35 mm or

less. With such a laser technique, dots with a diameter of less than approximately 200 μm , for example approximately 150 to 175 μm , can be achieved in the case of a carrier part made of a material suitable for the purpose. *An average person skilled in the art will be able to name widely varying suitable materials for the carrier part which not only permit the application of such a fine dot code by a laser technique which is known per se, but also provide an optically opaque background for trouble-free reading of the dot code. Polystyrene, possibly provided with a suitable filling agent or filling substance, can be mentioned as an example of such a suitable material. Another example which can be mentioned is ABS (acrylonitrile butadiene styrene), which in itself has a white basic structure and lends itself very well to burning in a very fine dot code by means of a laser technique. Other plastics, for example filled with titanium white or zinc white, seem suitable for burning in a very fine dot code by a laser technique, but plastic to which TiO_2 coated ground mica particles are added are also very suitable for this purpose.*

See col. 2, lines 50-67, bridging to col. 3, lines 1-9 of Wijnschenk et al. [emphasis added]. As set forth above, Wijnschenk et al. discloses the use of polymers, or optionally the use of polymers admixed with fillers, to form a plastic piece, i.e., the carrier part 6. It is in a surface of the carrier part 6 that the coding 9 is ablated. In view of the foregoing, it is submitted that the carrier part 6 simply cannot be construed as a "coating".

Even assuming that carrier part 6 could be fairly construed as a "coating", it is submitted that the carrier part 6 is not deposited onto the bottom surface of the tubular container 2. In Wijnschenk et al. the bottom surface of the tubular container 2 is clearly identified as the bottom surface 3, not the planar surface 7 as contended by the Examiner. See col. 6, lines 36-48 of Wijnschenk et al. The carrier part 6, which is detachable from the tubular container 2, is suspended below the bottom surface 3 of the tubular container 2. The suspension of the carrier part 6 is accomplished by means of retaining lugs (8 or 18) which allow the carrier part 6 to be removably attached from the tubular container 2. See col. 3, lines 15-56, col. 6, lines 49-67 bridging to col. 7, lines 1-4 of Wijnschenk et al. While the suspended carrier part 6 may, in some instances, releasably contact the bottom surface 3 of the tubular container 2, for example when the bottom surface 3 functions as stop, such contact clearly can not be construed as the deposition of a "coating" onto the bottom surface 3.

In view of the above, it is respectfully submitted that for at least this reason the obviousness rejection of claim 22 be withdrawn.

There is ample precedent for doing so. This application is a continuation of U.S. Pat. Appln. Ser. No. 09/399,404 (hereinafter referred to as "the '404 application"), now U.S. Pat. 6,372,293 (hereinafter referred to as the '293 patent"), a copy of which is attached hereto as Exhibit A. Claim 1 of the '293 patent reads as follows:

A test tube, comprising:

a tube body of unitary construction comprising an enclosed sidewall and an integral bottom that together define a tubular container having an open top, wherein said bottom has a concave interior surface and a planar exterior surface upon which machine readable data is encoded within multi-layered opaque coatings of contrasting colors that are deposited onto said planar exterior surface to uniquely identify said test tube. [emphasis added]

During prosecution of the '404 application, this claim was rejected under 35 U.S.C. §103 as being unpatentable over WO/9805427 (hereinafter "the '427 application"), attached hereto as Exhibit B, in view of Moh et al. See Exhibit C attached hereto. The '427 application is the same as Wijnschenk et al. In response to the rejection of claim 1, Appellants submitted arguments to overcome the obviousness rejection of claim 1. See Exhibit D attached hereto. The Examiner ultimately allowed claim 1 after recognizing that the primary issue in regard to the patentability of claim 1 was whether the '427 application in view of Moh et al. taught or suggested a test tube of unitary construction. See Exhibits E and C attached hereto. Although claim 22 is broader than claim 1, the same "unitary construction" issue is present here, and pursuant to the doctrine of *res judicata* the Examiner should be precluded from departing from the Patent Office's previous decision.¹

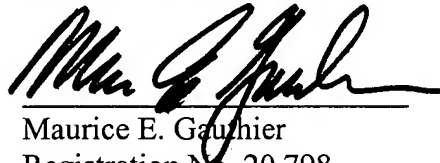
Claim 29 is directed to a method which comprises the steps of providing a tube body of unitary construction having a bottom exterior surface, applying an opaque coating to the exterior surface and encoding machine readable data within the opaque coating. For the reasons discussed above, it is respectfully submitted that Wijnschenk et al., either alone or in combination with Moh et al., fails to teach or suggest the claimed method.

¹ The doctrine of *res judicata* is not only applied to judicial court proceedings but is also applied to quasi-judicial action in the Patent Office. Overland Motor Company v. Packard Motor Company et al., 274 U.S. 417 (1927). The issuance of '293 patent, a quasi-judicial action by the Patent Office, waives the right of the Patent Office to raise identical issues in a continuation application, which claims priority from the issued patent, that were finally decided during the prosecution of the issued patent. Id. at 421.

SUMMARY

For all of the foregoing reasons, Appellants respectfully requests that the Board of Patent Appeals and Interferences reverse the Examiner's final rejection of claims 22, claims 23-28 and 33-36 dependent thereon, claim 29 and claims 30-33 dependent thereon.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Maurice E. Gauthier", written over a horizontal line.

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9. APPENDIX

APPEALED CLAIMS

1 22. A test tube, comprising:
2 a tube body of unitary construction comprising an enclosed sidewall and an integral bottom
3 that together define a tubular container having an open top, wherein said bottom has an exterior
4 surface upon which machine readable data is encoded within an opaque coating deposited onto said
5 exterior surface to uniquely identify said test tube.

1 23. The test tube of claim 22, wherein said opaque coating comprises: a first layer of
2 light colored opaque material deposited onto said exterior surface; and a second layer of dark
3 colored opaque material deposited onto said first layer, with select portions of said second layer
4 having been removed to define said machine readable data.

1 24. The test tube of claim 22 wherein said machine readable data is encoded by
2 exposing said coating to a coherent light source.

1 25. The test tube of claim 23 wherein said machine readable data is encoded by
2 removing selected portions of said second layer to expose underlying portions of said first layer.

1 26. The test tube of claim 25 wherein the selected portions of said second layer are
2 removed by exposure to a coherent light source.

1 27. The test tube of claim 23 wherein said first layer is white and said second layer is
2 black.

1 28. The test tube of claims 23 or 27 wherein said first and second layers comprise metal
2 foils.

3 29. A method of manufacturing a test tube, comprising the steps of: providing a tube
4 body of unitary construction comprising an enclosed sidewall with an open top and an integral
5 bottom with an exterior surface;
6 applying an opaque coating to said exterior surface; and
7 encoding machine readable data within said opaque coating.

1 30. The method of claim 29 wherein the application of said opaque coating comprises
2 the steps of:

- 3 a) depositing a first layer of opaque material onto said exterior surface; and
4 b) depositing a second layer of opaque material onto said first layer, wherein said first
5 and second layers are of contrasting colors.

1 31. The method of claim 30 wherein said first and second layers comprises metal foils
2 deposited by hot stamping.

 32. The method of claim 29 wherein said machine readable data is encoded by exposing
selected portions of said opaque coating to a coherent light source.

1 33. The test tube of claim 24 wherein said opaque coating undergoes a change in
2 color when exposed to said coherent light source.

1 34. The test tube of claim 33 wherein said opaque coating includes a light sensitive
2 pigment that undergoes said change in color.

1 35. The method of claim 32 wherein said opaque coating undergoes a change in
2 color when exposed to said coherent light source.

1 36. The method of claim 35 wherein said change in color is effected by altering the
2 color of a light sensitive pigment included in said opaque coating.

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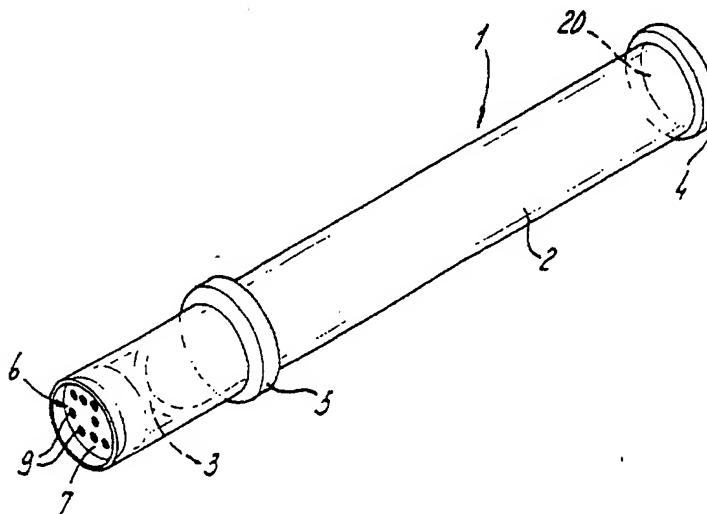
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(71) Applicant (for all designated States except US): MICRONIC B.V. [NL/NL]; P.O. Box 604, NL-8200 AP Lelystad (NL).
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(54) Title: TEST TUBE WITH OPTICALLY READABLE CODING



(57) Abstract

The invention relates to a test tube comprising a tubular container, which tubular container at its bottom end is provided with an optically readable coding such as a dot code, and in which the optically readable coding is applied to an optically substantially opaque surface. The optically opaque surface is preferably substantially flat and faces downwards. For constructional reasons it is very advantageous if the optically opaque surface is applied to a carrier part fixed to the bottom end of the tubular container. The invention also relates to a rack with a multiplicity of accommodation positions for accommodating test tubes according to the invention therein, the accommodation positions being optically open at the underside. The invention further relates to an assembly comprising a rack according to the invention and an optical reading mechanism for reading the optical codings on the underside of the test tubes according to the invention placed in the rack.

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TEST TUBE WITH OPTICALLY READABLE CODING

The present invention relates to a test tube, comprising a tubular container, which tubular container at its bottom end is provided with an optically readable coding such as a dot code.

5 A container resembling such a test tube is known from WO 94/02857.

A test tube in this case should be understood as meaning a container for storing substances, as well in liquid form, as in powder form as in solid form, for chemical analyses, sample storage etc. Such
10 test tubes can range in size from small test tubes, for example test tubes with a capacity of 0.2 ml, to large test tubes with a capacity of 10 ml or more.

Test tubes are commonly used for storing samples, such as blood samples of humans and animals, for possible subsequent analysis. Such
15 samples may be divided among a number of test tubes if necessary. In addition, many samples are stored for other purposes. In the case of all these applications it is extremely important to be able to code the test tubes, in order to be able to keep a record of the contents of each test tube. The test tubes are generally arranged in the racks in an 8 x 12
20 configuration, so that each rack contains 96 test tubes. It is known to allocate a position code to each test tube in the rack by numbering the rows and columns. The eight rows are then numbered, for example, A to H, while the twelve columns are numbered 1 to 12. In this way, depending on the position in the rack, each test tube can be given its own code, for
25 example A1, C7, H9 etc. Such a coding is generally not indicated on the tubes, but along the sides of the rack. Such a coding may also be indicated on the tube itself, if desired, this being of benefit only if the tube does not form a fixed part of the rack. These codings are designed to be read with the human eye. These codings are applied
30 directly to the transparent test tube, which has the disadvantage that in the case of certain substances the coding is very difficult or impossible to read.

A container bearing some resemblance to the test tube of the type mentioned at the beginning is known from International Patent
35 Application WO 94/02857. This publication relates to a "reagent bottle identification and reagent monitoring system for a chemical analyzer". In this case, in a chemical analyzer use is being made of reagent bottles which at their top end are provided with a narrowed neck and at their

bottom end are provided with a dot code at the downward facing surface of the bottom. This dot code is applied to a printed label which can be fixed by means of an adhesive to the downward facing surface of the bottom. According to a preferred embodiment, each label here has a light-
5 coloured background on which a contrasting pattern of dots is printed. As stated in this publication, smallest dot sizes with a diameter of approximately 850 μm can be achieved here, while the surface required for the dot code must have a diameter of at least approximately 13 mm.

The object of the present invention is to provide a coded test
10 tube, preferably a uniquely coded test tube, in the case of which the coding is readable at all times.

This object is achieved according to the invention with a test tube comprising a tubular container, which tubular container at its bottom end is provided with an optically readable coding such as a dot
15 matrix, characterized in that the optically readable coding is applied to an optically substantially opaque surface, in other words, an optically substantially opaque background with a surface bearing the coding. Applying the optically readable coding to an optically substantially opaque background ensures that the optical coding is readable at all
20 times with an optical reading mechanism, irrespective of the substance present in the generally transparent test tube. If the surface or the background is not or is insufficiently optically opaque, errors could occur during reading of the code, as a result of reflections coming from the substance present in the test tube. By applying the optically
25 readable coding at the bottom end of the test tube, simple automated reading of the coding with the aid of an optical reading mechanism is made possible. For the test tube need only be held with its bottom end towards an optical reading mechanism, which is then possible in principle while the test tube is still in a rack, even if a number of test tubes
30 are situated next to each other in the rack.

In order to be able to read the optically readable coding from underneath with great certainty, it is advantageous according to the invention if the optically substantially opaque surface is substantially flat and faces downwards, and extends substantially in the crosswise
35 direction of the tube. Making the surface flat ensures that the risk of errors during the automated optical reading of the coding is minimized by avoiding optical deformations, and providing the surface facing downwards at the bottom end of the tubular container ensures that the circumferential measurements of the tubular container can remain

substantially unchanged.

Since, on account of their material properties, not all test tubes can be provided with an optically opaque surface, i.e. an optically opaque background, applied directly thereto, and not every test tube material is so suitable for direct application of a coding thereto, it is advantageous according to the invention if said surface is applied to a carrier part fixed to the bottom end of the tubular container. Such a carrier part according to the invention can be fixed to the tubular container if the tubular container comprises retaining means, such as a retaining lug or retaining recess, at its bottom end, but it is also very conceivable for the carrier part to be glued or stuck or pressed onto the tubular container.

According to a special, advantageous embodiment, the carrier part will be made of a material which is different from the material from which the tubular container is made and which is suitable for the application of the optically readable coding. This makes it possible to continue using materials which have proved very suitable for the actual test tube itself, such as in particular optically transparent materials, and still to provide said test tube with an optical coding which is easily readable in all circumstances.

In order also in particular to be able to provide very small test tubes - for example, having a diameter of approximately 8.5 mm and smaller - with a coding which is unique for the test tube in question, it is very advantageous according to the invention if the material of the carrier part is suitable for burning in the optically readable coding by means of a laser technique, which coding in this case is preferably a fine dot code. What is meant here by a fine dot code is a code in which the centre-to-centre distance between adjacent dots is less than 0.5 mm, preferably 0.4 to 0.35 mm or less. With such a laser technique, dots with a diameter of less than approximately 200 μm , for example approximately 150 to 175 μm , can be achieved in the case of a carrier part made of a material suitable for the purpose. An average person skilled in the art will be able to name widely varying suitable materials for the carrier part which not only permit the application of such a fine dot code by a laser technique which is known per se, but also provide an optically opaque background for trouble-free reading of the dot code. Polystyrene, possibly provided with a suitable filling agent or filling substance, can be mentioned as an example of such a suitable material. Another example which can be mentioned is ABS (acrylonitrile butadiene styrene), which in

itself has a white basic structure and lends itself very well to burning in a very fine dot code by means of a laser technique. Other plastics, for example filled with titanium white or zinc white, seem suitable for burning in a very fine dot code by a laser technique, but plastic to which TiO_2 -coated ground mica particles are added are also very suitable for this purpose.

The carrier part according to the invention can advantageously be a part moulded onto the tubular container, such as a gated plastic part. Plastics are relatively easily gated into other plastics or other materials, retaining means or interlocking means possibly being provided so that they remain joined to each other.

According to the invention, the carrier part can be designed in many different ways. For example, according to the invention it is very conceivable for the carrier part to comprise at its top side a cavity in which the bottom end of the tubular container is accommodated and is fixed to the carrier part by means of a snap connection. However, it is also very conceivable for the carrier part to be accommodated in the tubular container, by extending the side wall of the tubular container at its bottom end until it is beyond the bottom of the tubular container, in order to form a space below said bottom for accommodating the carrier part. In order to be able to confine a carrier part in this space, it is advantageous according to the invention in this case if at the bottom end of the extended side wall at least one retaining lug pointing into the space or at least one retaining recess which opens towards the space is provided. The carrier part can then be fitted in the space and the retaining lug or retaining recess will prevent the carrier part from coming out of the space.

According to an advantageous embodiment, the carrier part in this case is a plastic part injected into the space. Such a plastic part can then be injected into this space after or during the manufacture of the test tube. If this carrier part is injected into the space during or after or immediately after the manufacture, co-moulding processes suitable for this purpose which are known per se from the prior art can then be used. The plastic part in this case can be a plastic which is selected for its properties in connection with the application of the optically readable coding thereto. The optically readable coding must be able to adhere to this plastic part, and this plastic part must provide an optically substantially opaque surface, which is readily achievable by using a non-transparent, i.e. opaque, plastic. According to another

advantageous embodiment of the invention, the carrier part is an element which is fixed by snapping between the at least one retaining lug and a further stop member, such as the bottom of the tubular container. Such an element can therefore then be fitted in the space formed below the bottom
5 of the tubular container after the test tube has been formed, by pressing said element into it, after which a snap-in lock holds the element in place.

According to a further advantageous embodiment of the test tube according to the invention, at its bottom end the tubular container is
10 provided with an annular groove formed on the outside, which groove preferably extends over at least part of, but preferably over the entire circumference of the container, and at its bottom end the tubular container is further provided with one or more, preferably two, three or four, channels extending from the annular groove to substantially the
15 bottom end of the tubular container, and the carrier part comprises:

- a plate situated at the bottom end of the tubular container;
- arms extending from the plate through the channels to the annular groove; and
- a ring extending through the groove;

20 the plate, the arms and the ring being formed integrally from plastic, and the arms and the ring retaining the plate at the bottom end of the container. Making the bottom end of the container in such a way means that the so-called carrier part can easily be applied as a moulded-on part by an injection moulding technique, a reliable permanent fixing of
25 the carrier part to the tubular container being ensured by the ring, which bears the plate (to which the coding can be applied) by way of the arms. According to a further advantageous embodiment, the channels in this case are grooves formed in the outside wall of the container. This makes it possible also to produce the tubular container as an injection
30 moulded product. It is particularly advantageous here if the carrier part accommodates the bottom end of the container in a close-fitting manner as a sort of basket, the free spaces in the wall of the basket-type part (i.e. the spaces between the grooves/channels/arms) accommodating projecting parts at the bottom end of the container. A reliable, simple
35 and sturdy retention of the carrier part on the tubular container is thereby ensured.

According to an advantageous embodiment, the tubular container can be made of a polypropylene or polypropene or other plastic suitable for test tubes. Types of polypropylene or polypropene suitable for test

tubes are generally known from the prior art. Types of polypropylene or polypropene suitable for test tubes form a generally unsuitable substrate for an optically readable coding, unless something is added for such a coding.

5 A test tube according to the invention is also preferably transparent.

The invention also relates to a rack, in particular a storage and/or transportation rack, with a multiplicity of accommodation positions for accommodating test tubes according to the invention
10 therein, the accommodation positions being optically open at the underside, in such a way that the optically readable coding of test tubes to be placed therein can be read from the "underside" of the rack with an optical reading mechanism. What is meant in this case by "underside" of the rack is the underside of the rack viewed from the orientation of the
15 test tubes, the side of the rack where the bottom ends of the tubular containers are situated then forming the underside of the rack. Such a rack has the advantage that the test tubes placed therein can be read by means of an optical reading mechanism without the test tubes first having to be removed from the rack. According to a further special embodiment,
20 such a rack comprises test tubes according to the invention in at least a number of the accommodation positions, possibly in all accommodation positions. In particular, the rack can have 96 accommodation positions placed in a 12 x 8 matrix pattern. The test tubes in this case can be small test tubes with a diameter of approximately 8.5 mm and a centre-to-
25 centre distance of approximately 9 mm, for example 8.5 to 9.5 mm, between adjacent test tubes. What is meant in this case by centre-to-centre distance is the distance between the longitudinal axes of adjacent test tubes.

The invention also relates to an assembly comprising a rack
30 according to the invention, test tubes according to the invention and an optical reading mechanism for reading the optical codings on the test tubes.

The invention also relates to an assembly comprising a rack according to the invention and an optical reading mechanism, the optical
35 reading mechanism comprising a supporting frame for supporting the rack to be placed thereon, in which a multiplicity of substantially vertically oriented test tubes can be placed, and a reader fitted in the supporting frame and reading substantially in the vertical, upward direction. Such an assembly of a rack and an optical reading mechanism makes it possible

to place a fully or partially filled rack on the reading mechanism and to have the optical codings of the test tubes placed in the rack automatically read out by the reader. The reading mechanism in this case will preferably be provided with a microprocessor which is equipped to

5 allocate the codes which have been read to the accommodation position in the rack. This makes it possible, by means of suitable display means, to obtain information on the position of a particular test tube in the rack. In order to be able to establish unequivocally the position of the test tubes in the rack, it is advantageous according to the invention if the

10 rack and the optical reading mechanism are provided with means for unequivocally determining or recording the position or orientation of the rack relative to that of the reading mechanism or the frame thereof. Such means can comprise a further optical coding which is applied to the underside of the rack, and which is then readable by the reading

15 mechanism, but it is also very conceivable for such means to comprise mechanical means which ensure that the rack can be placed only in one position on the frame, or which make it possible to place the rack in an unequivocally determined position on the frame of the reading mechanism.

It is also advantageous if a switch which emits a "correct" or

20 "incorrect" signal or both types of signals is activated, for example by means of a lug or notch, when the rack is positioned correctly or incorrectly respectively.

The optical coding used according to the invention is preferably a unique coding, i.e. a coding system by means of which a

25 virtually infinite number of unique codings can be achieved. Such a coding system can comprise a so-called bar code, but will preferably consist of a matrix-like pattern of dark and light dots, i.e. a matrix-like pattern in which all matrix points are dark or light, for example black or white. Such a coding made up of a dot matrix can also be

30 indicated by the term dot array and is also sometimes called a dote code. Theoretically, it is then possible with, for example, a 5×5 matrix to achieve approximately 33 million (2^{25}) unique codings, and with a 7×7 even 2^{49} (approximately $5.6 \cdot 10^{14}$) different unique codes can be achieved. However, it will be clear that matrices with an uneven number

35 of rows and columns can also be used, as can other figures based on a dots pattern. For instance, it is also conceivable to achieve a dot coding on the basis of a number of concentric dot circles, or on the basis of a spiral-shaped pattern of dots. Usable dot codings are known per se from the prior art.

The present invention will now be explained in greater detail with reference to exemplary embodiments shown in the drawing, in which:

Fig. 1 shows a perspective view of a test tube according to the invention;

5 Fig. 2a shows a longitudinal sectional view of the test tube shown in Fig. 1;

Fig. 2b shows a detail view of the bottom end of a test tube according to a further variant of the invention;

10 Fig. 3 shows a view in disassembled parts of a rack according to the invention, which rack is provided with a multiplicity of accommodation positions for test tubes;

Figs. 4 and 5 show two detail views of a rack from Fig. 3 completely filled with test tubes, the locking element being shown in the releasing and locking positions;

15 Fig. 6 shows a diagrammatic, perspective view of an assembly according to the invention, comprising a rack and an optical reading mechanism; and

20 Fig. 7 shows a perspective view, with disassembled parts, of the bottom end of an embodiment of a test tube according to the invention.

Fig. 1 shows a test tube 1. Said test tube 1 consists substantially of a tubular container 2 having at its top end a filling aperture 20 which may be shut off if necessary. At the bottom end, the tubular container 2 is provided with a bottom 3, in the exemplary
25 embodiment shown a dome-shaped bottom 3. At its bottom end, the test tube is further provided with an optically readable coding 9, in the form of a dot matrix. Said optically readable coding is applied to an optically substantially opaque surface, i.e. a surface or background which is opaque to the optical reading mechanism to be used, so that the reading
30 with the optical reading mechanism cannot be interfered with as a result of substances, powders, liquids or solid particles present in the test tube. The term "optically opaque" is thus related to the optical reading mechanism used, and in general will amount to said surface or background also being opaque to the human eye. The optically substantially opaque
35 surface is indicated by 7.

The test tube shown in Fig. 1 and Fig. 2a relates to a test tube with a length of approximately 40 mm and an external diameter of approximately 8.5 mm. The surface available on surface 7 for the optical code, i.e. the dot code, has a diameter of approximately 3 mm. The

material of which the tubular container is made in this embodiment is a transparent PP plastic.

The optically substantially opaque surface 7 is substantially flat and directed downwards, so that it extends crosswise to the lengthwise direction of the tubular container 2. This means that the optical coding can be read from underneath with an optical reading mechanism, the term "from underneath" being related to a vertical position of the test tube shown in Figs. 2a and 2b.

The optically opaque surface 7 in the case of the test tube according to Fig. 1 is applied to a carrier part 6 fixed at the bottom end of the tubular container 2, which carrier part can be made of, for example, polystyrene or ABS. Said carrier part 6 in the case of Figs. 1 and 2a is a disc-like element which is enclosed in a space bounded at the top side by the bottom 3 of the tubular container 2 and bounded in the circumferential direction by an extension 22 of the longitudinal side wall of the tubular container 2. Lugs 8 are formed on the underside of the extension 22, for keeping the carrier part 6 confined in the space thus formed. The carrier part 6 can be a plastic element injected into said space, but it can also be a disc pressed into the space along the two lugs 8.

Fig. 2b illustrates an alternative embodiment of a test tube according to the invention which is provided with a carrier part. In this case only the bottom end of the test tube is shown. The tubular container in this case is indicated by 12, the carrier part by 16, the optically opaque surface by 17, the coding applied thereto by 19, and the bottom of the tubular container by 13. The carrier part 16 shown in Fig. 2b can be regarded as a tubular container with a cylindrical circumferential wall and a closed bottom. The optically substantially opaque surface 17 to which the coding 19 has been applied is then situated on the underside of the bottom. The tubular container 12 is pressed from the top with its bottom end into the cavity enclosed by the carrier part 6 and can be connected to the carrier part 6 by gluing, clamping or in some other way. According to an advantageous embodiment, one or more outward projecting retaining lugs are formed on the outer circumference of the tubular container 12 at the bottom end thereof, in order to fix the tubular container 12 to the carrier part 16, which retaining lugs can engage in corresponding retaining recesses formed in the inside wall of the cylindrical part of the carrier part 16. In this way a snap connection can be produced between the carrier part and the tubular container.

The provision of the optically substantially opaque surface and/or the optical coding (thereon) by means of a separate carrier part has the advantage that it is possible to use a carrier part with properties which are optimal for forming an optically substantially
5 opaque surface, or at any rate an optically substantially opaque background, or for applying thereto an optically substantially opaque surface and applying an optical coding to the optically substantially opaque surface. These properties, in particular the material properties, are in fact generally not found in the test tubes used in practice. This
10 means that in the case of the test tubes used in practice it is very difficult or even impossible to apply an optically readable coding thereto in a suitable and reliable manner. Moreover, most test tubes in practice are transparent, which would mean that an optically opaque surface would then first have to be formed on the tubular container.

15 Fig. 7 shows a further variant of a test tube according to the invention. Fig. 7 shows disassembled the bottom part of a test tube 100, which consists of a tubular container 102 with a bottom end 110 and a supporting collar 105, which has the same function as the supporting collar 5 of the test tube from Figs. 1 and 2a. The bottom end 110 of the
20 tubular container 102 is provided on the outside in the outside wall with an annular groove 103 extending around the entire circumference. The bottom end 110 is further provided with four (only two are visible) channels 104 in the form of grooves 104 extending from the bottom end 101 of the tubular container 102 up to, and even slightly beyond, the annular
25 groove 103. Said grooves 104 and 103 can be provided by cutting material out of a tubular container 102 accordingly at its bottom end, but these grooves 103 and 104 can also be formed directly during the injection moulding of such a tubular container, by providing the injection mould with correspondingly complementary parts. For the sake of clarity, a
30 carrier part 112 is shown as a separate part below the tubular container 102. This carrier part 112 consists of a plate 107 which at its underside, (not visible) is substantially flat, and is provided with a dot code burned in by means of a laser technique, and consists of four arms 108 and a ring 109 interconnecting the arms 108. Four recesses 111
35 are formed between the arms 108 and the ring 109. It will be clear from Fig. 7 that the carrier part 112 and the bottom end 110 of the tubular container 102 fit precisely into each other in a manner which is such that the projecting parts 106 are ultimately situated precisely in the recesses 111, and the plate 107 is ultimately situated under the bottom

101 of the tubular container 102. The carrier part 112 in this case is, as it were, a sort of basket which can accommodate the bottom end 110 of the tubular container 102 in a close-fitting manner. When the carrier part 112 is situated on the bottom end 110 of the tubular container 102, the arms 108 and the ring 109 will preferably not project relative to the essentially cylindrical tubular external surface 115 of the tubular container 102. The plate 107 will preferably also be slightly recessed in the bottom end, in such a way that the bottom ends of the parts 106 project beyond the plate 107. In this way it is ensured that the bottom surface of the plate 107 is slightly protected by the projecting bottom ends of the parts 106. The carrier part 112 can easily be directly injected onto or gated into the bottom end 110 of the tubular container. This can be carried out simultaneously with the injection moulding of the tubular container 100, but also in a second step after the tubular container 100 has been formed by injection moulding. It will be clear that the projecting parts 106 form, as it were, retaining projections and that the grooves 104 and 103 form, as it were, retaining recesses.

Figs. 3, 4 and 5 show a storage and/or transportation rack according to the invention, in which a multiplicity of test tubes according to the invention can be accommodated in such a way that the test tubes can be read from the "underside" of the rack with an optical reading mechanism. This rack will be discussed in greater detail below.

The rack 30 consists substantially of a plate 31 which has therein a matrix pattern of 8×12 accommodation positions 32 in the form of passages formed through the plate 31. A test tube 1 according to the invention can be placed in each accommodation position 32, by inserting said test tube with its bottom end into an accommodation position. The test tubes 1 inserted into an accommodation position 32 then remain with their supporting collar 5 resting on the plate 31. The centre-to-centre distance between adjacent accommodation positions 32 is approximately 9 mm in this example.

The rack 30 can also optionally be provided with a locking slide 33 with twelve parallel slits, each overlapping a row of eight accommodation positions 32. Each slit 34 is provided with a series of knurls 35, provided opposite each other and facing each other on either side of each slit 34. The distance between two adjacent knurls 35 situated along one side of the slit 34 is equal to the centre-to-centre distance between two adjacent accommodation positions 32. The distance between two knurls 35 situated opposite each other is smaller than the

diameter of the supporting collar 5 and equal to or slightly greater than the diameter of the tubular container 2 directly above the supporting collar 5. The slide 33 at its underside is provided with a sliding or guide mechanism, comprising four L-shaped hooks 36, which fit into the
5 recesses 38 formed in the plate 31. When the slide 33 is inserted with its hooks 36 into the recesses 38, the slide 33 can be moved to and fro in the direction of arrow V, in which case the movement of the slide 33 is limited by the recesses 38 interacting with the vertical parts 39 of the L-shaped hooks 36. The slide 33 is thus slidable to and fro between a
10 releasing position shown in Fig. 4 and a locking position shown in Fig. 5. In the releasing position it is possible to lift test tubes out of the rack, through the fact that between the knurls 35 the slits 34 have sufficient width to allow the supporting collar 5 of the test tubes 1 to pass. In the locked state shown in Fig. 5 the test tubes 1 are fixed
15 in the plate 31 by the fact that the knurls 35 have been slid over the supporting collars 5. It goes without saying that the slide 33 can be fixed in the locking position shown in Fig. 5 by means of locking means (not shown). It will be clear that the sliding or guide mechanism can also be designed differently.

20 The rack 30 is optically open, i.e. optically transparent, at its underside, so that a reading mechanism placed below the rack 30 and reading in the vertically upward direction can read off the optically readable codings applied to the underside of the test tubes 1. This can be achieved easily in the case of rack 30, as shown in Fig. 3, by
25 designing the rack 30 as an inverted, thin-walled tray which is physically open at the bottom (as shown in Fig. 3) or as a solid plate with recesses 32 (as shown in Fig. 6). In this Fig. 6 an optical reader 52 is also shown very diagrammatically, which optical reader, as will be clear from Fig. 6, can read off from underneath the optical coding on the
30 underside of the test tubes 1.

Fig. 6 shows very diagrammatically an assembly containing a rack 30 and an optical reading mechanism 50. The optical reading mechanism 50 consists of a supporting frame 51 for supporting the rack 30 to be placed thereon. A region 53 is formed in the supporting frame,
35 situated under a rack 30 placed thereon, in which region 53 an optical reader 52 is fitted, which optical reader can be moved through this region by means of an electronically controlled control unit. The optical coding on the underside of each test tube placed in the rack 30 can be read out by means of said reader 52. It is also conceivable if desired to

provide the region 53 with one optical reader which can read out the codings on the underside of all test tubes simultaneously. The reader 52 shown can read out the codings per test tube or the codings of groups of test tubes simultaneously.

5 The frame 50 is further provided with a recess 54, which can interact with a lug 54 on the rack 30, in order to fix the orientation of the rack 30 unequivocally relative to the frame 51.

 The data read by the optical reader can be transmitted by means of a cable 56 with a plug 57 to a further processing unit, such as a
10 computer.

 With the aid of such an assembly it thus becomes possible to store all data relating to the tubes present in a rack in a computer or other data storage device. The advantages which can be achieved hereby are wide-ranging and will be clear straight away without further
15 explanation.

 Instead of moving the optical reader itself, it is also conceivable to move the rack over or along the optical reader. The supporting frame could in that case be, for example, a guide plate, guide rails or a roller track.

Claims

1. Test tube, comprising a tubular container (2, 12), which tubular container at its bottom end is provided with an optically readable coding (9, 19) such as a dot code. characterized in that the
5 optically readable coding is applied to an optically substantially opaque background (7, 17).
2. Test tube according to Claim 1. characterized in that said background has a surface which is substantially flat and faces downwards, and extends substantially in the crosswise direction of the tube.
- 10 3. Test tube according to one of the preceding claims, characterized in that said background or said surface is provided by or applied to a carrier part (6, 16) fixed to the bottom end of the tubular container (2, 12).
4. Test tube according to Claim 3. characterized in that the
15 carrier part is made of a material which is different from the material from which the tubular container is made and is suitable for the application of the optically readable coding.
5. Test tube according to Claim 4. characterized in that the material of the carrier part is suitable for burning in the optically
20 readable coding by means of a laser technique, which coding is preferably a fine dot code with a centre-to-centre distance between the dots of less than 0.5 mm, preferably less than 0.4 to 0.35 mm.
6. Test tube according to Claim 5. characterized in that the dots have a diameter of less than approximately 200 μm , preferably
25 approximately 150 to 175 μm or smaller.
7. Test tube according to one of Claims 3 - 6. characterized in that the carrier part is a part moulded onto the tubular container, such as a gated-in plastic part.
8. Test tube according to one of Claims 3 - 7. characterized in
30 that the tubular container comprises retaining means (8, 18), such as a retaining lug or retaining recess, at its bottom end, for fixing the carrier part (6, 16) to the tubular container (2, 12).
9. Test tube according to one of Claims 3 - 8. characterized in that the carrier part (16) comprises at its top side a cavity in which
35 the bottom end of the tubular container (12) is accommodated, and in that the carrier part and the bottom end are fixed to each other by means of a snap connection (18).
10. Test tube according to one of Claims 3 - 8. characterized in

that the side wall of the tubular container (2) at its bottom end is extended (22) beyond the bottom (3) of the tubular container (2), in order to form a space below said bottom for accommodating the carrier part (6).

- 5 11. Test tube according to Claim 10, characterized in that the bottom end of the extended side wall (22) is provided with at least one retaining lug (8) pointing into the space.
12. Test tube according to Claim 10 or 11, characterized in that the carrier part (6) is a plastic part injected into the space.
- 10 13. Test tube according to Claim 11, characterized in that the carrier part (6) is an element (6) which is fixed by snapping between the at least one retaining lug (8) and a further stop member (3), such as the bottom of the tubular container.
14. Test tube according to one of Claims 1 - 13, characterized in
15 that at its bottom end the tubular container is provided with an annular groove formed on the outside, which groove extends over at least part of, but preferably over the entire circumference of the container, and in that at its bottom end the tubular container is further provided with one or more, preferably two, three or four, channels extending from the
20 annular groove to substantially the bottom end of the tubular container, and in that the carrier part comprises:
- a plate situated at the bottom end of the tubular container;
 - arms extending from the plate through the channels to the annular groove; and
 - 25 - a ring extending through the groove;
- the plate, the arms and the ring being formed integrally of plastic, and the arms and the ring retaining the plate at the bottom end of the container.
15. Test tube according to Claim 13, characterized in that the
30 channels are grooves formed in the outside wall of the container.
16. Test tube according to Claim 12 or 13, characterized in that the carrier part accommodates the bottom end of the container in a close-fitting manner as a sort of basket, the free spaces in the wall of the basket-type part accommodating projecting parts at the bottom end of the
35 container.
17. Test tube according to one of the preceding claims, characterized in that the tubular container (2, 12) is made of polypropylene or polypropene or polystyrene.
18. Test tube according to one of the preceding claims,

characterized in that the test tube is transparent.

19. Test tube according to one of the preceding claims,

characterized in that the carrier part, or at any rate the part to which the coding is applied, comprises polystyrene, ABS or a plastic filled
5 with titanium white or zinc white, possibly in the form of a mixture with another substance/another material, such as a plastic.

20. Storage or transportation rack (30), with a multiplicity of accommodation positions (32) for accommodating therein test tubes (1) according to one of the preceding claims, the accommodation positions
10 (32) being optically open at the underside, in such a way that the optically readable coding (9, 19) of test tubes (1) to be placed therein can be read from the "underside" of the rack (30) with an optical reading mechanism (50, 52).

21. Storage or transportation rack according to Claim 20, in which
15 test tubes according to one of Claims 1 - 18 are accommodated in at least a number of the accommodation positions, possibly in all accommodation positions.

22. Storage or transportation rack according to Claim 20 or 21,
characterized in that the rack has 96 accommodation positions placed in a
20 12 x 8 matrix pattern.

23. Assembly comprising a rack (30) according to one of Claims 20 - 22 and an optical reading mechanism or optical reader.

24. Assembly comprising a rack (30) according to one of Claims 20 - 23 and an optical reading mechanism (50), the optical reading mechanism
25 (50) comprising a supporting frame (51) for supporting the rack (30) to be placed thereon, in which a multiplicity of substantially vertically oriented test tubes (1) can be placed, and a reader (52) fitted in the supporting frame (51) and reading substantially in the vertical, upward direction.

30 25. Assembly according to one of Claims 23 - 24, in which the optical reading mechanism (50) is provided with a microprocessor which is equipped to allocate the codings which have been read to the accommodation positions (32) in the rack (30).

26. Assembly according to one of Claims 23 - 25, in which the rack
35 (30) and the optical reading mechanism (50) are provided with means (54, 55) for unequivocally determining or recording the position or orientation of the rack (30) relative to that of the reading mechanism (50) or the frame (51) thereof.

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fig-1

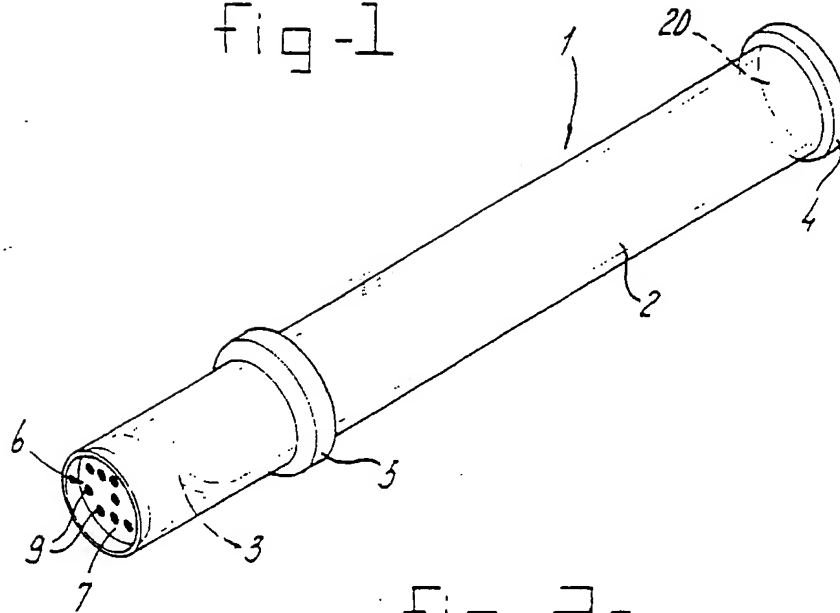


fig-2a

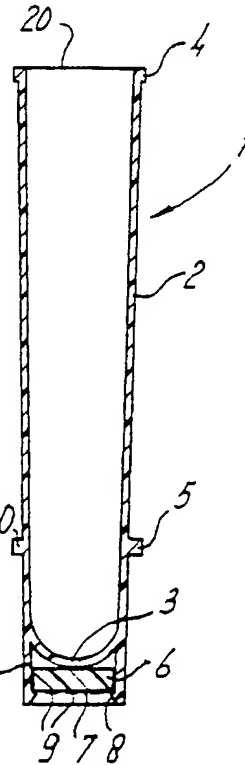
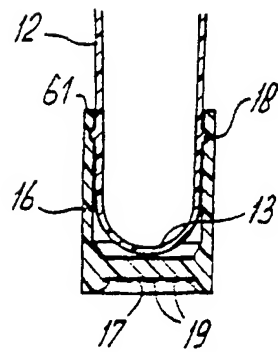


fig-2b



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Fig - 3

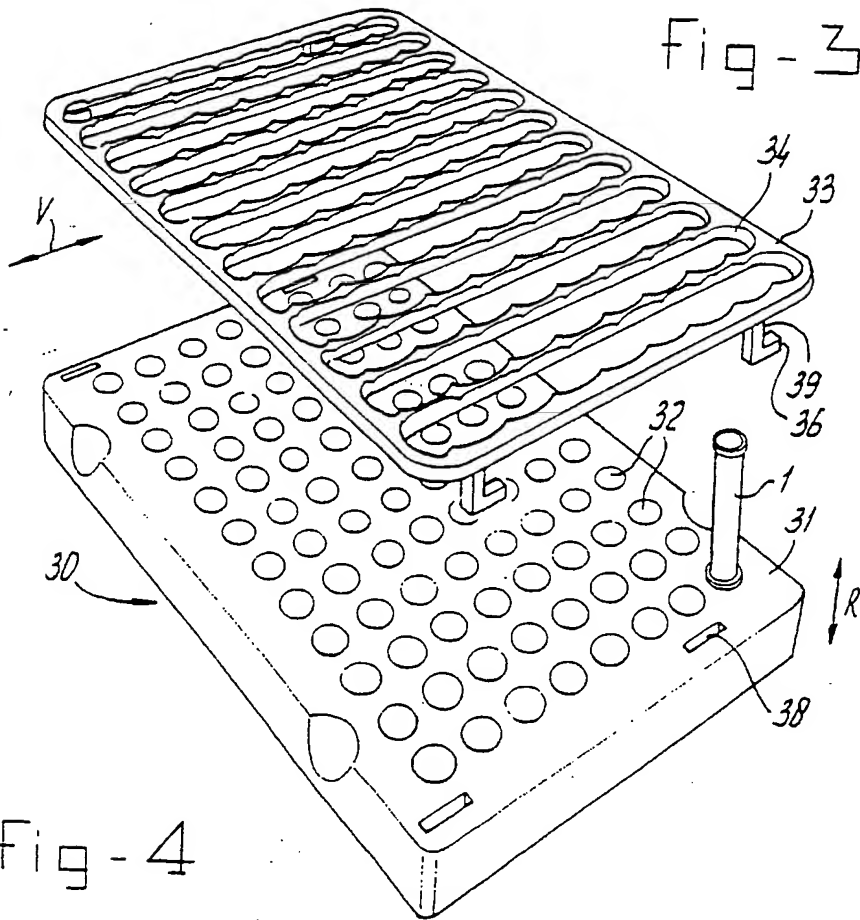


Fig - 4

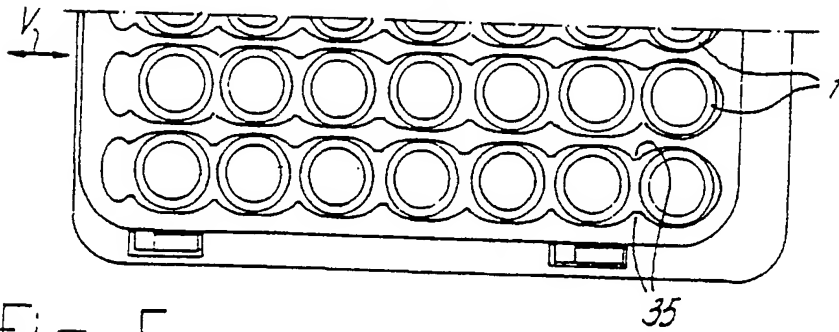
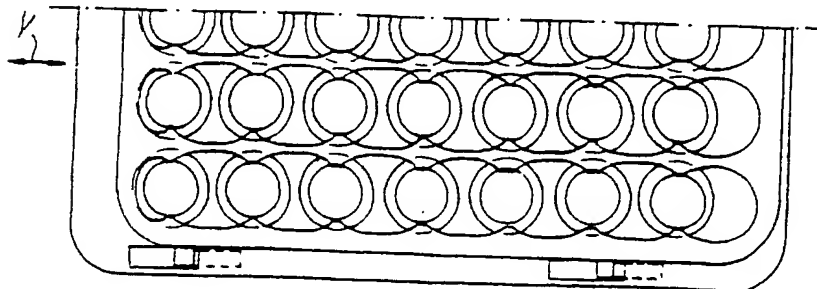


Fig - 5



INTERNATIONAL SEARCH REPORT

International Application No

PCT/NL 97/00447

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US 4990792 A	05-02-91	CH 676644 A AT 124555 T DE 3829025 A DE 58909317 D	15-02-91 15-07-95 15-02-90 03-08-95

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/NL 97/00447

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4990792 A		EP 0354362 A	14-02-90
WO 9718896 A	29-05-97	FI 955611 A	23-05-97
		AU 7575096 A	11-06-97
WO 9607479 A	14-03-96	NONE	



UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/393,405 09/20/99 BEGUIN

D 5043

EXAMINER

IME2/0614

PATRICK J O'SHEA
SAMUELS GAUTHIER & STEVENS LLP
225 FRANKLIN STREET SUITE 3300
BOSTON MA 02110

PRODDGE, J

ART UNIT

PAPER NUMBER

1723

DATE MAILED:

06/14/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/399,405

Applicant(s)

TORTI ET AL

Examiner

Joseph Drodge

Art Unit

1723



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 6
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 U.S.C. § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 1723

3. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Publication WO 98/05427 in view of Moh et al patent 6,214,250.

Publication '427 discloses test tube 1 having sidewall 2, open top 20, concave inner surface 3 or 13 (figures 2A and 2B) , planar bottom exterior surface 6 or 17, with a single layer of machine readable data containing layer deposited thereupon (9 or 19). The data code is disclosed as being opaque and applied by laser ablating procedures (page 8, lines 25-35 and page 10, lines 30-35).

The claims differ in requiring the data code to be applied as a 2 layer coating that is deposited upon the lower planar exterior surface. However, Moh et al teach such two layer data code containing deposits applied to the exterior of a wide range of substrate products including glassy products, bottles and other small apparatus (see particularly column 2, line 28-column 3, line 17 and column 5, lines 42-61). Although language "opaque" is not explicitly recited in Moh et al, numerous coating layer materials which are inherently opaque are taught in column 8, lines 52-57. At the time the present invention was made, it would have been obvious to one of ordinary skill in this art to have modified the '427 apparatus by applying a two layer, data code containing, coating to the bottom exterior surface of the test tube rather than the disclosed one layer coating, as taught by Moh et al, in order to develop a code that can be modified and augmented repeatedly during production of and the service life of the test tube, and without damage to the substrate of the test tube itself.

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Specifically regarding claim 3, '427 teaches first cylindrical segment 3, second larger diameter segment 4 or 5 and intermediate short length of truncated conical segment therebetween as shown in figure 2A.

Regarding claims 7, 8, 12 and 13, although "hot stamping" per se. is not disclosed, Moh et al disclose various methods of applying heat and pressure to the layers during lamination to each other and to the substrate (column 16, lines 1-14, etc.)

Regarding claims 2, 4 and 5, Moh et al teach black and white layers in column 7, lines 12-53.

Regarding claims 6, 9-11, 14, 15, 17, 20 and 21, Moh et al teach a plurality of laser and other techniques of removing material to form the data code including laser ablating, abrading and etching.

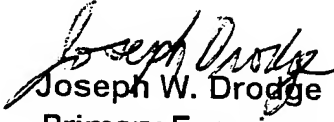
Regarding claim 16, 18 and 19, Moh et al teach applying of multiple code patterns, one or more of which may be human readable and/or alphanumeric (column 3, lines 5-15).

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph W. Drodge whose telephone number is (703) 308-0403. The examiner can normally be reached on Monday-Friday from approximately 8:30 AM - 4:45 PM.

The fax phone number for this Group is (703) 305-3599. When filing a FAX in Tech Center 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are not for entry into the file of the application. This will expedite processing of your papers.

Art Unit: 1723

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.


Joseph W. Drodge
Primary Examiner
Art Unit 1723

JWD
June 14, 2001

FORM PTO-1449 SAMUELS, GAUTHER & STEVENS
(Rev. 5/92) 225 Franklin Street, Boston, MA 02119
Telephone: (617) 426-9188

ATTORNEY DOCKET NO. 5043

SERIAL NO. 09/399,405

Sequin et al.
APPLICANT

1743 1723
GROUP

09/20/99
FILING DATE

Unknown DRODGE
EXAMINER

INFORMATION DISCLOSURE

STATEMENT BY APPLICANT APR 03 2000

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
JWD	AA	3,818,188	06/18/74	Hertel et al.			
	AB	4,924,078	05/08/90	Sant'Anselmo et al.	235	494	
	AC	4,939,354	07/03/90	Priddy et al.	235	456	
	AD	4,990,792	02/05/91	Frei	235	488	
	AE	5,357,095	10/18/94	Weyrauch et al.	235	494	
	AF	5,420,408	05/30/95	Weyrauch et al.	235	488	
JWD	AG	5,777,303	07/07/98	Berney	235	486	

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO
JWD	AH	2266641	10/31/75	France			
	AI	2649511	01/11/91	France			
	AJ	1003725	04/01/98	Netherlands			
	AK	1003726	04/01/98	Netherlands			
	AL	WO89/08264	09/08/88	PCT WIPO			
	AM	WO94/02857	02/03/94	PCT WIPO			
	AN	WO96/07479	03/14/96	PCT WIPO			
	AO	WO96/08433	03/21/96	PCT WIPO			
	AP	WO97/18896	05/29/97	PCT WIPO			
JWD	AQ	WO98/05427	02/12/98	PCT WIPO			

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Notice of References Cited

Applicant/Patent
TORTI ET AL

Application/Control No.
09/399,405

Examiner
Joseph Drodge

Art Unit
1723

Page 1 of 1

U.S. PATENT DOCUMENTS

	Document Number Country Code-Number-Kind Code	Date MM-YYYY ¹	Name	Classification ²	
A	6,214,250	4/2001	MOH ET AL	235	494
B					
C					
D					
E					
F					
G					
H					
I					
J					
K					
L					
M					

FOREIGN PATENT DOCUMENTS

	Document Number Country Code-Number-Kind Code	Date MM-YYYY ¹	Country	Name	Classification ²	
N						
O						
P						
Q						
R						
S						
T						

NON-PATENT DOCUMENTS

	Include, as applicable: Author, Title, Date, Publisher, Edition or Volume, Pertinent Pages
U	
V	
W	
X	

¹ A copy of this reference is not being furnished with this Office action. See MPEP § 707.05(a).

¹ Dates in MM-YYYY format are publication dates.

² Classifications may be U.S. or foreign.



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
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Washington, D.C. 20231

APPLICATION NUMBER <i>09/399,405</i>	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
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EXAMINER

ART UNIT	PAPER NUMBER <i>10</i>
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DATE MAILED:

INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel):

(1) *Torah Dodge* (3) _____
(2) *Patrick O'Neil* (4) _____

Date of Interview *9-18-2001*

Type: ☒ Telephonic ☐ Televideo Conference ☐ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No If yes, brief description: _____

Agreement ☐ was reached. ☒ was not reached. *(No agreement)*

Claim(s) discussed: _____

Identification of prior art discussed: *Search art it covered*

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: *It was agreed that the agency issue to patentability of step 1427 and step 241 exp. by 2a-2b of 1427 make it impossible to have the claimed "uplay instruction"*

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☐ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary, A FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW: (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

Examiner Note: You must sign this form unless it is an attachment to another form.

*Clean Copy of the Claims
Following Entry of This Amendment*

1. A test tube, comprising:

a tube body of unitary construction comprising an enclosed sidewall and an integral bottom surface that together define a tubular container having an open top, wherein said bottom surface has a concave interior surface and a planar exterior surface upon which machine readable data is encoded within multi-layered opaque coatings of contrasting colors that are deposited onto said planar exterior surface to uniquely identify said test tube.
2. The test tube of claim 1, wherein said multi-layered opaque coating comprises:

a first layer of light colored opaque material deposited onto said planar exterior surface;

and

a second layer of dark colored opaque material deposited onto said first layer, wherein select portions of said second layer are removed to define a machine readable data matrix code indicative of said test tube.
3. The test tube of claim 1, wherein said sidewall is defined by a plurality of segments having different cross sections, said plurality of segments comprising:

a first cylindrical sidewall segment integral with said bottom surface;

a second cylindrical sidewall segment; and

a truncated conical segment located between said first and second cylindrical sidewall segments and having increasing diameter closer to said open top.
4. The test tube of claim 3, wherein said multi-layered planar coating comprises:

a first layer of opaque white material deposited on said exterior planar surface; and
a second layer of opaque black material deposited on said first layer.

5. The test tube of claim 3, wherein said multi-layered planar coating comprises:
a first layer of white foil deposited on said exterior planar surface; and
a second layer of black foil deposited on said first layer.

6. A method of manufacturing a test tube, comprising the steps of:
providing a tube body of unitary construction comprising an enclosed sidewall and an
integral bottom surface that together define a tubular container having an open top, wherein said
bottom surface has a concave interior surface and a planar exterior surface;
depositing a multi-layered opaque coating onto the planar exterior surface to provide a data
matrix code that uniquely identifies the test tube, wherein said step of depositing comprises the
steps of

- (i) depositing a first layer of opaque material onto the planar exterior surface;
- (ii) depositing a second layer of opaque material onto the first layer, wherein the
first layer and the second layer are contrasting colors; and
- (iii) removing portions of the second layer to define the data matrix code.

7. The method of claim 6, wherein said step of depositing a first layer comprises the step of
hot stamping the first layer onto the planar exterior surface.

8. The method of claim 7, wherein said step of depositing a second layer comprises the step of hot stamping the second layer onto the first layer.
9. The method of claim 8, wherein said step of removing portions of the second layer to define the data matrix code comprises the step of applying a coherent light source to remove the select portions of the second layer to define the data matrix code.
10. The method of claim 9, wherein the coherent light source is a laser.
11. A method of marking a test tube having a tube body of unitary construction comprising an enclosed sidewall and an integral bottom surface that together define a tubular container having an open top, wherein the bottom surface has a concave interior surface and a planar exterior surface, said method of marking comprising the steps of:
 - depositing a multi-layered opaque coating onto the planar exterior surface to provide a data matrix code that uniquely identifies the test tube, wherein said step of depositing comprises the steps of
 - (i) depositing a first layer of opaque material onto the planar exterior surface;
 - (ii) depositing a second layer of opaque material over the first layer, wherein the first layer and the second layer are contrasting colors; and
 - (iii) removing portions of the second layer to define the data matrix code.
12. The method of claim 11, wherein said step of depositing a first layer comprises the step of

hot stamping the first layer of opaque material onto the planar exterior surface.

13. The method of claim 12, wherein said step of depositing a second layer comprises the step of hot stamping the second layer of opaque material onto the first layer.

14. The method of claim 13, wherein said step of removing portions of the second layer to define the data matrix code comprises the step of applying a coherent light source to remove the select portions of the second layer to define the data matrix code.

15. The method of claim 14, wherein said coherent light source is a laser.

16. The method of claim 11, further comprising the step of:

depositing a multi-layered opaque coating onto the enclosed sidewall to provide a second data matrix code that uniquely identifies the test tube.

17. The method of claim 16, wherein said step of depositing a multi-layered opaque coating onto the enclosed sidewall comprises the steps of:

(i) depositing a first sidewall layer of opaque material onto the exterior sidewall;

(ii) depositing a second sidewall layer of opaque material over the first sidewall layer, wherein the first sidewall layer and the second sidewall layer are contrasting colors;

and

(iii) removing portions of the second sidewall layer to define the second data matrix

code.

18. The method of claim 11, further comprising the step of removing portions of the second layer to define a human readable alphanumeric code.

19. The method of claim 11, further comprising the step of removing portions of the second layer to define a human readable alphanumeric code around the periphery of the planar exterior surface.

20. (amended) A test tube, comprising:

a cylindrical side wall open at its upper end and closed at its lower end by a bottom wall, said bottom wall having a concave interior surface and a planar exterior surface, wherein said cylindrical side wall and said bottom wall are of unitary construction;

a covering integrally applied to said exterior surface, said covering having a first layer overlying a second layer, said first and second layers being opaque and of contrasting colors; and

machine readable data encoded into said covering by selective removal of portions of said first layer in order to expose corresponding underlying portions of said second layer.

21. A test tube, comprising:

a tube body of unitary construction comprising an enclosed sidewall and an integral bottom surface that together define a tubular container having an open top, wherein said bottom surface has a concave interior surface and a planar exterior surface upon which

machine readable data is encoded within an opaque coating of contrasting colors deposited onto said planar exterior surface to uniquely identify said test tube.

REMARKS

Claim 20 has been amended. Claims 1-21 remain for further consideration. The rejections shall be taken up in the order presented in the Official Action.

The undersigned representative and Examiner Drodge had a telephone conference on September 18, 2001 to discuss the rejections set forth in the Official Action. Specifically, we discussed a feature of the present invention wherein the test tube comprises a tube body of unitary construction. We also discussed PCT published application No. PCT/NL97/00447. No agreement was reached.

1-3. Claims 1-21 currently stand rejected for allegedly being obvious in view of Publication WO 98/05427 (hereinafter "'427") in combination with U.S. Patent 6,214,250 to Moh et al. (hereinafter "Moh").

I. THE PRESENT INVENTION

The present invention is directed to a test tube that comprises a tube body of unitary construction including an enclosed sidewall and an integral bottom surface that together define a tubular container having an open top. The bottom surface has a concave interior surface and a planar exterior surface upon which machine readable data is encoded within a multi-layered opaque coating that is deposited onto the planar exterior surface to uniquely identify the test tube. The machine readable data is preferably an open (i.e., non-proprietary) data matrix code. This code is applied to the test tube by depositing a multi-layer coating onto the planar exterior of the

tube bottom surface. The multi-layer coating may include a first layer of opaque material that is deposited onto the planar exterior surface, and a second layer of opaque material that is deposited onto the first layer. The machine readable code is formed in the multi-layered coating by removing portions of the second layer.

II. THE CITED ART

A. The '427 Publication

This publication discloses a test tube that includes a detachable carrier portion comprising an optically readable coding, such as a dot code. The carrier portion is attached to the bottom of the tubular container, which is the main body of the test tube. For example, the '427 Publication discloses that the carrier portion is fixed to the tubular container by a retaining lug or recess, or by being glued, stuck or pressed onto the tubular container. Specifically, the '427 Publication discloses "such a carrier part according to the invention can be fixed to the tubular container if the tubular container comprises retaining means, such as a retaining lug or retaining recess, at its bottom end, but it is also very conceivable for the carrier part to be glued or stuck or pressed onto the tubular container." (emphasis added, page 3, lines 7-12). In addition, the '427 Publication discloses "the tubular container 12 is pressed from the top with its bottom end into the cavity enclosed by the carrier part 6 and can be connected to the carrier part 6 by gluing, clamping, or in some other way." (emphasis added, page 9, lines 30-32).

The '427 Publication also discloses "*the carrier part will be made of a material which is different from the material from which the tubular container is made and which is suitable for the application of the optically readable coding.*" (page 3, lines 13-16). Since the components are

constructed from different materials, the carrier part and the tubular container cannot be of unitary construction.

Hence, a fair and proper reading of the '427 Publication discloses:

- (i) the carrier part is separate from the test tube;
- (ii) the carrier part can be attached and detached from the test tube; and
- (iii) the carrier part includes the optical machine readable coding.

B. The '250 Patent

The '250 Patent discloses a composite material for labeling a substrate. This patent neither discloses nor suggests any test tube structure.

III. DIFFERENCES BETWEEN THE PRESENT INVENTION AND THE CITED ART

Claim 1 of the present invention recites a test tube that includes a test tube body of unitary construction comprising a bottom surface having a concave interior surface and a planar exterior surface. Machine readable data is encoded within multi-layered opaque coatings of contrasting colors, which are deposited onto the planar exterior surface to uniquely identify the test tube.

Significantly, the machine readable data is encoded on the planar exterior surface of the test tube body. Advantageously, the unitary construction (i.e., single piece) of the test tube prevents the encoded data from being separated from the test tube body, since the data is encoded onto the planar exterior surface, which is a unitary part of the test tube body. In contrast, the '427 Publication discloses that the encoded data is placed on a carrier part, and the carrier part is then affixed to the test tube. Therefore, the component that includes the encodings (that is the carrier)

is not of a unitary construction with respect to the test tube. This is a problem since the carrier portion and the tubular container are physically separate devices. As discussed in the background section of the present invention, in use, the carrier may become separated from the tubular container, which defeats the purpose of providing each tube with identification information. In addition, using separate components leads to additional manufacturing costs and complexity.

The '250 Patent clearly neither discloses nor suggests a test tube as recited.

Hence, the combined teachings of the '427 Publication and the '250 Patent neither discloses nor suggests a test tube having a tube body of unitary construction, which includes a bottom surface that comprises a planar exterior surface onto which machine readable data is encoded. That is, there is no proper combination of references that discloses a test tube that includes machine readable data encoded on a planar exterior bottom surface, wherein the test tube is of a unitary construction.

Claim 6 is directed to a method of manufacturing a test tube, that includes the step of:

"providing a tube body of unitary construction comprising an enclosed sidewall and an integral bottom surface that together define a tubular container having an open top, wherein said bottom surface has a concave interior surface and a planar exterior surface". (emphasis added).

Again, the references fail to disclose or suggest a tube body of unitary construction that includes a planar exterior surface that is marked with machine readable data.

Claim 11 recites a method of marking a test tube having a tube body of unitary construction comprising an enclosed sidewall and an integral bottom surface that together define a tubular container having an open top. The bottom includes a planar exterior surface, onto which a multi-layered opaque coating is placed to provide a data matrix code that uniquely identifies the

test tube.

As amended claim 20 recites a test tube that comprises:

“a cylindrical side wall open at its upper end and closed at its lower end by a bottom wall, said bottom wall having a concave interior surface and a planar exterior surface, wherein said cylindrical side wall and said bottom wall are of unitary construction;”. (emphasis added).

Claim 21 recites a test tube that comprises

“a tube body of unitary construction comprising an enclosed sidewall and an integral bottom surface that together define a tubular container having an open top, wherein said bottom surface has a concave interior surface and a planar exterior surface upon which machine readable data is encoded within an opaque coating of contrasting colors deposited onto said planar exterior surface to uniquely identify said test tube”. (emphasis added).

Again, there is simply no proper combination of references that discloses a test tube of unitary construction having a bottom surface on which machine readable data is encoded with multi-layered opaque coatings.

As set forth above, the subject matter of the present invention is directed to a test tube which comprises a tube body of unitary construction, wherein the bottom surface of the test tube has a concave interior surface and a planar exterior surface upon which machine readable data is encoded within multi-layered opaque coatings of contrasting colors deposited onto the planar exterior surface to uniquely identify the test tube.

Since the combined references neither disclose nor suggest the claimed invention, reconsideration and allowance of claims 1-21 is respectfully requested.

If a telephone interview could assist in the prosecution of this application, please call the undersigned attorney.

Respectfully submitted,

A handwritten signature in cursive script that reads "Patrick O'Shea". The signature is written in dark ink and is positioned above a horizontal line.

Patrick J. O'Shea
Registration No. 35,305
Samuels, Gauthier & Stevens LLP
225 Franklin Street, Suite 3300
Boston, Massachusetts 02110
Telephone: (617) 426-9180 x121

VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

1. A test tube, comprising:

a tube body of unitary construction comprising an enclosed sidewall and an integral bottom surface that together define a tubular container having an open top, wherein said bottom surface has a concave interior surface and a planar exterior surface upon which machine readable data is encoded within multi-layered opaque coatings of contrasting colors that are deposited onto said planar exterior surface to uniquely identify said test tube.

2. The test tube of claim 1, wherein said multi-layered opaque coating comprises:

a first layer of light colored opaque material deposited onto said planar exterior surface;

and

a second layer of dark colored opaque material deposited onto said first layer, wherein select portions of said second layer are removed to define a machine readable data matrix code indicative of said test tube.

3. The test tube of claim 1, wherein said sidewall is defined by a plurality of segments having different cross sections, said plurality of segments comprising:

a first cylindrical sidewall segment integral with said bottom surface;

a second cylindrical sidewall segment; and

a truncated conical segment located between said first and second cylindrical sidewall segments and having increasing diameter closer to said open top.

4. The test tube of claim 3, wherein said multi-layered planar coating comprises:
a first layer of opaque white material deposited on said exterior planar surface; and
a second layer of opaque black material deposited on said first layer.
5. The test tube of claim 3, wherein said multi-layered planar coating comprises:
a first layer of white foil deposited on said exterior planar surface; and
a second layer of black foil deposited on said first layer.
6. A method of manufacturing a test tube, comprising the steps of:
providing a tube body of unitary construction comprising an enclosed sidewall and an integral bottom surface that together define a tubular container having an open top, wherein said bottom surface has a concave interior surface and a planar exterior surface;
depositing a multi-layered opaque coating onto the planar exterior surface to provide a data matrix code that uniquely identifies the test tube, wherein said step of depositing comprises the steps of
 - (i) depositing a first layer of opaque material onto the planar exterior surface;
 - (ii) depositing a second layer of opaque material onto the first layer, wherein the first layer and the second layer are contrasting colors; and
 - (iii) removing portions of the second layer to define the data matrix code.
7. The method of claim 6, wherein said step of depositing a first layer comprises the step of hot stamping the first layer onto the planar exterior surface.

8. The method of claim 7, wherein said step of depositing a second layer comprises the step of hot stamping the second layer onto the first layer.
9. The method of claim 8, wherein said step of removing portions of the second layer to define the data matrix code comprises the step of applying a coherent light source to remove the select portions of the second layer to define the data matrix code.
10. The method of claim 9, wherein the coherent light source is a laser.
11. A method of marking a test tube having a tube body of unitary construction comprising an enclosed sidewall and an integral bottom surface that together define a tubular container having an open top, wherein the bottom surface has a concave interior surface and a planar exterior surface, said method of marking comprising the steps of:
 - depositing a multi-layered opaque coating onto the planar exterior surface to provide a data matrix code that uniquely identifies the test tube, wherein said step of depositing comprises the steps of
 - (i) depositing a first layer of opaque material onto the planar exterior surface;
 - (ii) depositing a second layer of opaque material over the first layer, wherein the first layer and the second layer are contrasting colors; and
 - (iii) removing portions of the second layer to define the data matrix code.

12. The method of claim 11, wherein said step of depositing a first layer comprises the step of hot stamping the first layer of opaque material onto the planar exterior surface.
13. The method of claim 12, wherein said step of depositing a second layer comprises the step of hot stamping the second layer of opaque material onto the first layer.
14. The method of claim 13, wherein said step of removing portions of the second layer to define the data matrix code comprises the step of applying a coherent light source to remove the select portions of the second layer to define the data matrix code.
15. The method of claim 14, wherein said coherent light source is a laser.
16. The method of claim 11, further comprising the step of:
depositing a multi-layered opaque coating onto the enclosed sidewall to provide a second data matrix code that uniquely identifies the test tube.
17. The method of claim 16, wherein said step of depositing a multi-layered opaque coating onto the enclosed sidewall comprises the steps of:
 - (i) depositing a first sidewall layer of opaque material onto the exterior sidewall;
 - (ii) depositing a second sidewall layer of opaque material over the first sidewall layer, wherein the first sidewall layer and the second sidewall layer are contrasting colors;and

(iii) removing portions of the second sidewall layer to define the second data matrix code.

18. The method of claim 11, further comprising the step of removing portions of the second layer to define a human readable alphanumeric code.

19. The method of claim 11, further comprising the step of removing portions of the second layer to define a human readable alphanumeric code around the periphery of the planar exterior surface.

20. (amended) A test tube, comprising:

a cylindrical side wall open at its upper end and closed at its lower end by a bottom wall, said bottom wall having a concave interior surface and a planar exterior surface, wherein said cylindrical side wall and said bottom wall are of unitary construction;

a covering integrally applied to said exterior surface, said covering having a first layer overlying a second layer, said first and second layers being opaque and of contrasting colors; and machine readable data encoded into said covering by selective removal of portions of said first layer in order to expose corresponding underlying portions of said second layer.

21. A test tube, comprising:


a tube body of unitary construction comprising an enclosed sidewall and an integral bottom surface that together define a tubular container having an open top, wherein said

bottom surface has a concave interior surface and a planar exterior surface upon which machine readable data is encoded within an opaque coating of contrasting colors deposited onto said planar exterior surface to uniquely identify said test tube.



Interview Summary

Application No. 09/399,405	Applicant(s) TORTI ET AL
Examiner JOSEPH DRODGE	Group Art Unit 1723



Participants (applicant, applicant's representative, PTO personnel):

- | | |
|---------------------------|-----------|
| (1) <u>JOSEPH DRODGE</u> | (3) _____ |
| (2) <u>PATRICK O'SHEA</u> | (4) _____ |

Date of Interview Oct 25, 2001

Type: a) ☒ Telephonic b) ☐ Video Conference
c) ☐ Personal [copy is given to 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No. If yes, brief description:

Claim(s) discussed: 1, 4, 6, 9, 11, 14, and 21

Identification of prior art discussed:
None

Agreement with respect to the claims f) ☒ was reached. g) ☐ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments:

An Examiner Proposed Examiners Amendment was authorized to amend the above claims to correct 112@2 problems including replacing "bottom surface" with "bottom", for clarity, the Specification text was correspondingly modified to be consistent with the claims.

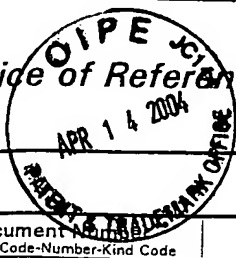
(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

i) ☒ It is not necessary for applicant to provide a separate record of the substance of the interview (if box is checked).

Unless the paragraph above has been checked, THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Notice of References Cited



Applicant/Patent
TORTI ET AL

Application/Control No.
09/399,405

Examiner
JOSEPH DRODGE

Art Unit
1723

Page 1 of 1

U.S. PATENT DOCUMENTS

* X	A	Document Number Country Code-Number-Kind Code	Date MM-YYYY ¹	Name	Classification ²	
		5,985,078	11/1999	SUESS ET AL	156	239
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

* N	O	P	Q	R	S	T	Document Number Country Code-Number-Kind Code	Date MM-YYYY ¹	Country	Name	Classification ²	

NON-PATENT DOCUMENTS

* U	V	W	X	Include, as applicable: Author, Title, Date, Publisher, Edition or Volume, Pertinent Pages

* A copy of this reference is not being furnished with this Office action. See MPEP § 707.05(a).

¹ Dates in MM-YYYY format are publication dates.

² Classifications may be U.S. or foreign.



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

IM52/1030

PATRICK J O'SHEA
SAMUEL'S GAUTHIER & STEVENS LLP
225 FRANKLIN STREET SUITE 3300
BOSTON MA 02110

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/399,405	09/20/99	921	DRODGE, J 1723	10/30/01
First Named Applicant	SEGUIN, 35 USC 154(b), term ext. = 0 Days.			

TITLE OF INVENTION TEST TUBE WITH DATA MATRIX CODE MARKINGS

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
1 5043	427-271.000	010	UTILITY	NO	\$1280.00	01/30/02

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.
If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
- B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
- B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give application number and batch number.
Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

YOUR COPY

Notice of Allowability

Application No.
09/399,405

Applicant(s)
TORTI ET AL

Examiner
JOSEPH DRODGE

Art Unit
1723



--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course. THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS. This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Amendment filed on September 20, 2001.
2. ☒ The allowed claim(s) is/are 1-21.
3. ☒ The drawings filed on Sep 20, 1999 are acceptable as formal drawings.
4. ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
*Certified copies not received: _____

5. ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE FOR SUBMITTING NEW FORMAL DRAWINGS, OR A SUBSTITUTE OATH OR DECLARATION.** This three-month period for complying with the REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL is extendable under 37 CFR 1.136(a).

6. ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
7. ☐ Applicant MUST submit NEW FORMAL DRAWINGS
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☐ to Paper No. _____
(b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the examiner.
(c) ☐ including changes required by the attached Examiner's Amendment/Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

8. ☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

Attachment(s)

- | | |
|--|---|
| 1 <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 4 <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No. <u>5, 10, 11</u> |
| 5 <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449), Paper No(s). _____ | 6 <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| 9 <input type="checkbox"/> Other | |

Art Unit: 1723

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Patrick O'Shea on October 25, 2001.

2. The application has been amended as follows:

In each of claim 1, line 3 (two occurrences); claim 3, line 3; claim 6, line 3 and line 4 (first occurrence); claim 11, line 2 and line 3 (first occurrence); and claim 21, line 3 (two occurrences); in the Specification, on page 3, in each of lines 5, 6 (first occurrence) and 11, on page 4, in each of lines 10 and 13, on page 5, in each of lines 1 and 4 and on page 6, in line 17 and in the body of the Abstract in each of lines 2, 3 (first occurrence) and 7 "surface" has been deleted. (The preceding lines on pages in the Specification are based on lines of actual text as filed, which does not necessarily correspond with line numbers in the left hand margins of Specification pages as filed)

In claim 4, in line 1 "planar" has been replaced with --opaque--.

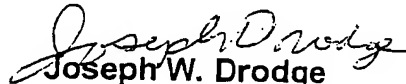
In line 3 of each of claims 9 and 14 "select" has been deleted.

Art Unit: 1723

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph W. Drodge whose telephone number is (703) 308-0403. The examiner can normally be reached on Monday-Friday from approximately 8:30 AM - 4:45 PM.

The fax phone number for this Group is (703) 305-3599. When filing a FAX in Tech Center 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are not for entry into the file of the application. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.


Joseph W. Drodge
Primary Examiner
Art Unit 1723

JWD
October 26, 2001